**1. Introduction**

**1.1 Background**

Airports are crucial hubs of transportation, and their performance directly impacts customer satisfaction and operational efficiency. Analyzing key performance indicators (KPIs) using data-driven insights can lead to better decision-making and optimization opportunities.

**1.2 Objectives**

This analysis aims to examine the performance of an airport using Power BI. The primary objectives are to gain insights into passenger traffic, flight punctuality, baggage handling efficiency, and revenue generation.

**1.3 Methodology**

The data was collected from various sources, including flight schedules, passenger information, baggage handling data, and revenue data. After data cleaning and integration, Power BI was utilized for data visualization and analysis.

**2. Data Collection and Preparation**

**2.1 Data Sources**

* The datasets used in this analysis include:
* Flight schedule data with flight numbers, scheduled and actual departure/arrival times.
* Baggage handling data with the number of bags loaded and lost for each flight.
* Revenue data with total revenue and the number of passengers.

**2.2 Data Cleaning and Integration**

Data cleaning involved removing any duplicates, correcting errors, and handling missing values. The datasets were then integrated based on common identifiers.

**2.3 Data Transformation and Modeling**

Data transformation included formatting date and time fields and creating new calculated columns for analysis. A data model was built to establish relationships between the tables.

**3. Exploratory Data Analysis**

**3.1 Passenger Traffic Analysis**

Passenger traffic showed a seasonal pattern, with peaks during certain months.

The highest passenger count was observed on 1/1/2022 with 150 passengers.

**3.2 Flight Punctuality Analysis**

* Flight punctuality varied across different flights, with some flights experiencing delays more frequently.
* FL004 had the best punctuality, with most flights departing and arriving on time.

**3.3 Baggage Handling Analysis**

* On average, 200 bags were loaded per flight, while FL038 had the fewest bags loaded (120 bags).
* Baggage loss was minimal, with an average of around 4 bags lost per flight.

**3.4 Revenue Analysis**

Revenue was directly related to the number of passengers, with some seasonal fluctuations.

**4. Power BI Implementation**

**4.1 Introduction to Power BI**

Power BI was chosen for its data visualization capabilities and interactive features.

**4.2 Data Visualization and Dashboard Design**

* Created a line chart to display passenger traffic trends over time.
* Used a bar chart to visualize flight punctuality rates for different flights.
* Presented a pie chart to show the distribution of revenue generated by each flight.

**4.3 Interactive Filtering and Slicing**

Implemented interactive filters to explore data based on specific time periods and flight numbers.

**4.4 Custom Calculations and Measures**

Calculated the total revenue based on the number of passengers and revenue per passenger.

**5. Airport Performance Analysis**

**5.1 Key Performance Indicators (KPIs)**

Passenger throughput, Flight punctuality, Baggage handling efficiency, and Revenue per passenger were identified as key KPIs.

**5.2 Comparative Analysis of Performance Metrics**

* Compared flight punctuality across different flights to identify those with the best and worst performance.
* Analyzed baggage handling efficiency and its relationship with the number of bags loaded and lost.

**5.3 Identification of Performance Bottlenecks**

Identified flights with a history of delays and baggage handling challenges.

**5.4 Performance Improvement Strategies**

Recommended optimizing flight schedules and implementing improved baggage handling procedures.

**6. Results and Findings**

**6.1 Overview of Airport Performance**

* The airport generally experiences a seasonal passenger traffic pattern.
* Some flights demonstrate excellent punctuality, while others need improvement.
* Baggage handling efficiency is satisfactory, with minimal baggage losses.
* Revenue is influenced by the number of passengers and seasonality.

**6.2 Insights from Passenger Traffic Analysis**

The airport should anticipate peak periods and allocate resources accordingly.

**6.3 Flight Punctuality Trends and Patterns**

Identify factors contributing to delays and implement corrective actions.

**6.4 Baggage Handling Efficiency Analysis**

Continue monitoring baggage handling efficiency to ensure passenger satisfaction.

**6.5 Revenue Analysis and Optimization Opportunities**

Focus on attracting more passengers during off-peak seasons to increase revenue.

**7. Discussion and Recommendations**

**7.1 Interpretation of the Findings**

Addressing performance bottlenecks can significantly improve customer satisfaction and operational efficiency.

**7.2 Implications for Airport Management**

Efficient baggage handling is critical to maintaining customer loyalty and minimizing complaints.

**7.3 Recommendations for Performance Enhancement**

* Optimize flight schedules to improve punctuality and reduce waiting times for passengers.
* Implement advanced baggage handling systems to minimize baggage loss.

**8. Conclusion**

**8.1 Summary of the Analysis**

The analysis of airport performance using Power BI provided valuable insights into passenger traffic, flight punctuality, baggage handling, and revenue generation.

**8.2 Conclusion**

By utilizing Power BI, the airport management can make informed decisions to enhance operational efficiency and customer satisfaction.